REMARKS

This Application has been carefully reviewed in light of the Office Action mailed November 13, 2009. At the time of the Office Action, Claims 1-7 and 10-16 were pending, and Claims 8-9 were previously withdrawn due to an election/restriction requirement. In the Office Action, Claims 1-7 and 10-16 were rejected. Claims 1 and 10 are herein amended. Applicant respectfully requests reconsideration and allowance of all pending Claims 1-16.

Rejections under 35 U.S.C. § 112 (written description)

Claims 1 and 10 were rejected by the Examiner under 35 U.S.C. §112, first paragraph, as allegedly failing to comply with the written description requirement. In particular, the Examiner argues that Applicant's disclosure does not support the claim feature that the *tube-shaped body* is not compressed during the pretensioning of the piezoelectric actuator. (Office Action, page 2). Applicant actually intended to recite (in Claims 1 and 10) that the ***tube spring*** is not compressed during the pretensioning of the piezoelectric actuator. Thus, Applicant has amended Claims 1 and 10 accordingly. Applicant's disclosure (e.g., the process shown and described with reference to Figs. 3A-3E) supports this feature -- that the *tube spring* is not compressed during the pretensioning of the piezoelectric actuator. Thus, the written description requirement under 35 U.S.C. §112, first paragraph, is fulfilled. Accordingly, Applicant respectfully requests that this rejection be withdrawn.

(Applicant notes that the current amendment of "tube-shaped body" to "tube spring" in Claims 1 and 10, and corresponding remarks herein, are note intended to imply anything about whether or not tube-shaped body is compressed, placed in tension, or otherwise.)

Claim Objections

Claims 1 and 10 were objected to because Applicant is claiming pretensioning the piezoelectric actuator by physically compressing the piezoelectric actuator but not the tube-shaped body, i.e., the same basis as the written description rejections discussed above. (Office Action, page 2). As discussed above, Applicant has amended Claims 1 and 10 to recite that the ***tube spring*** (rather than the ***tube-shaped body***) is not compressed during the pretensioning of the piezoelectric actuator. This feature is supported by Applicant's

disclosure, e.g., the process shown and described with reference to Figs. 3A-3E. Accordingly, Applicant respectfully requests that this objection be withdrawn.

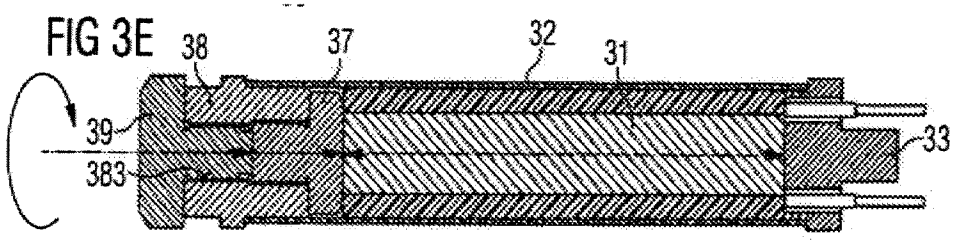
Rejections under 35 U.S.C. § 102

Claims 1, 4, 10 and 13 stand rejected under 35 U.S.C. §102(b) as being anticipated by U.S. Patent No. 6,499,471 issued to Jingming Jim Shen et al. ("*Shen*").

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987). Furthermore, "the identical invention must be shown in as complete detail as is contained in the ... claim." *Richardson v. Suzuki Motor Co. Ltd.*, 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989).

Although Applicant disagrees with the Examiner's rejections based on *Shen*, Applicant has amended independent Claims 1 and 10 to further distinguish from *Shen*. In particular, amended Claim 1 recites "a means for pretensioning the piezoelectric actuator after the tube spring is connected to the first cap and the tube-shaped body, the means for pretensioning being supported by the tube-shaped body and pretensions the piezoelectric actuator by physically compressing the piezoelectric actuator ***but not the tube spring***." Similarly, amended Claim 10 "a piezoelectric actuator pretensioning device supported by the tube-shaped body, the piezoelectric actuator pretensioning device configured to pretension the piezoelectric actuator, after the tube spring is connected to the first cap and the tube-shaped body, by physically compressing the piezoelectric actuator but not the tube spring."

This aspect of Applicant's invention is illustrated in Figure 3E:

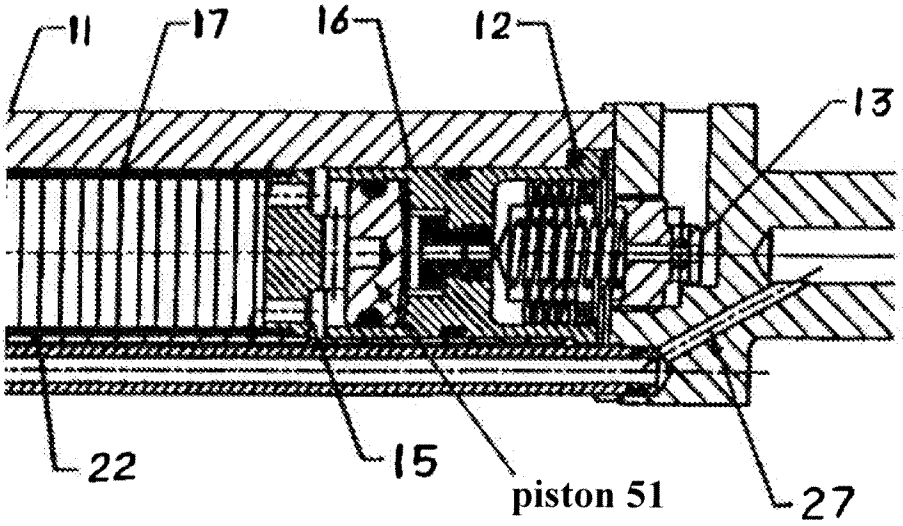


As explained at paragraph 0035-0038 of Applicant's specification, piezo actuator 31 is inserted into tube spring 32, and the opposite ends of tube spring 32 are attached to cap 33 and tube-shaped body 38, without pre-tensioning piezo actuator 31 (unlike in the prior art, including *Shen*). Instead of pre-tensioning piezo actuator 31 prior to securing tube spring 32, piezo actuator 31 is pre-tensioned by turning bolt 39. Screwing bolt 39 into a thread 383 of tube spring 32 forces body 37 to the right, thus compressing piezo actuator 31, ***but not tube spring 32*** (tube spring 32 is placed in tension by the compression of piezo actuator 31).

Pre-tensioning piezo actuator 31 in this manner -- *after securing* tube spring 32 at each end -- eliminates the problems associated with pre-tensioning a piezo actuator *while tube spring 32 is being secured*, as discussed at paragraph 0010 of the Specification, which explains:

> [0010] The invention . . . has the advantage that the joining of the tube-shaped body can be done without the piezoelectric actuator being pretensioned. This enables very good access for the joining tools as there is no need for another tool that applies a pretension force to the piezoelectric actuator while welding the tube-shaped body to the tube spring. The given pretension can then be adjusted after joining the tube-shaped body to the tube spring which makes it easier to set the pretension to a given level.

Unlike Applicant's invention, the piezoelectric actuator stack 22 in *Shen* is presumably pre-tensioned while the tube spring 17 is being secured at the ends, as there is no other way for piezoelectric actuator stack 22 to be pre-tensioned in *Shen*. Accordingly, *Shen* does not teach "a means for pretensioning the piezoelectric actuator after the tube spring is connected to the first cap and the tube-shaped body." However, even assuming for the sake of argument that screw 13, crush ring 12, hydraulic compensator 16, and tube spring 17 do in fact act to pre-tension piezoelectric actuator stack 22 (as argued by the Examiner at page 7 of the Final Office Action), they do not act by "physically compressing the piezoelectric actuator ***but not the tube spring***." Rather, piston 51 of hydraulic compensator 16 pushes against top 15 of piezoelectric actuator stack 22, which -- as shown in the portion of *Shen*'s Figure 1 copied below -- ***compresses both piezoelectric actuator stack 22 and tube spring 17 in unison***.



In other words, if piezoelectric actuator stack 22 is somehow compressed by hydraulic compensator 16, *tube spring 17 is compressed as well.* Thus, *Shen* teaches away from pre-tensioning a piezoelectric actuator by physically compressing the piezoelectric actuator *but not the tube spring*," as recited in amended Claims 1 and 10.

For at least the reasons presented above, amended Claims 1 and 10 are allowable over *Shen*. Therefore, Applicant respectfully requests reconsideration and allowance of amended Claims 1 and 10, as well as all claims that depend therefrom.

Rejections under 35 U.S.C. §103

Dependent Claims 2-3, 5-7, 11-12, and 14-16 stand rejected under 35 U.S.C. §103(a) as being unpatentable over *Shen* in view of U.S. Patent No. 6,326,717 issued to Patrick Mattes ("*Mattes*"). Applicant respectfully submits that dependent Claims 2-3, 5-7, 11-12, and 14-16 are allowable at least because they depend from amended independent Claims 1 and 10 shown above to be allowable.

CONCLUSION

Applicant has made an earnest effort to place this case in condition for allowance in light of the remarks set forth above. Applicant respectfully requests reconsideration of the pending claims.

Applicant believes there are no fees due at this time. However, the Commissioner is hereby authorized to charge any fees necessary or credit any overpayment to Deposit Account No. 50-4871 of King & Spalding LLP.

If there are any matters concerning this Application that may be cleared up in a telephone conversation, please contact Applicant's attorney at 512.457.2030.

Respectfully submitted,
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